

Patent Claims

1. A micro-structured paper or paper-like material having a self-cleaning and/or non-adhesive effect whereby said paper or paper-like material is hydrophobic across the entire cross-section of the material and which is micro-structured in such a way that the surface is provided with elevations and depressions whereby the distance between the elevations ranges from 0.04 to 100 microns and the height of the elevations ranges from 0.04 to 100 microns, and whereby said paper or paper-like material is characterized in that it contains particles having the size of 0.04 to 50 microns that are bound to said paper or paper-like material by means of a binder, and whereby said paper or paper-like material is hydrophobic across the entire cross-section of the material.

2. A paper or paper-like material having a non-adhesive affect according to claim 1, wherein said paper or paper-like material is additionally oil repellent.

3. A paper or paper-like material according to claim 1 or 2, wherein said paper or paper-like material has a contact angle with water greater than 120°.

4. A method to manufacture micro-structured paper or paper-like material that is water-repellant across the entire cross section of the material and having a self-cleaning and/or non-adhesive effect, and which is provided with elevations and depressions whereby the distance between the elevations ranges from 0.04 to 100 microns and the height of the elevations ranges from 0.04 to 100 microns as well, characterized in that particles of a size of 0.04 to 50 microns are added to the fibers of the paper or paper-like material and whereby said particles are fixed to the fibers by means of a binder together with the use of a water-repelling agent in the scope of a wet-laying method.

5. A method to manufacture micro-structured paper or paper-like material according to claim 4, wherein said fibers are cellulosic fibers.

6. A method according to one of the claims 4 or 5, wherein said employed fibers comprise synthetic fibers made of polypropylene (PP), polyvinyl acetate, polythethylene (PE) or polylactic acid (PLA).

7. A method according to one of the claims 4 through 6, wherein said particles are added in the amount of 5 to 65% per basis weight of said paper of paper-like material.

8. A method according to one of the claims 4 through 7, wherein an oil-repelling agent is jointly used in addition.

9. A method according to one of the claims 4 through 8, wherein said water-repelling agents and/or oil-repelling agents are agents manufactured according to the sol/gel (colloidal solution/gel) method.

10. A method according to one of the claims 4 through 9, wherein a second supplementary water-repelling and/or oil-repelling finishing is performed in addition to the first use of a water-repelling agent and possibly an oil-repelling agent.

11. A method according to one of the claims 4 through 10, wherein said particles are selected from inorganic compounds such as metal oxides, corundum, silicon dioxide, quartz, quartz powder, silica brine;  $TiO_2$ , carbonates and sulfates, china clay or talcum.

12. A method according to one of the claims 4 through 11, wherein the binder is selected from latex binders, acrylate binders, and/or styrene binders, and/or

fluorinated silanes, fluorinated and non-fluorinated siloxanes, and/or functionalized and non-functionalized silicone oils.

13. A method according to one of the claims 4 through 12, which includes an additional step of printing one micro-structured side of said paper.
14. A method according to claim 13, wherein said printing occurs before making said paper or paper-like material water-repellant or oil-repellant, or water- and oil-repellant in combination.
15. Use of a paper or paper-like material according to claim 1, 2 or 3 as release paper, packing paper or cardboard boxes, posters or other liquid-repellant papers that are exposed to environmental influences, for example.